

American Computer Science League

2020-2021 • Contest 2: Lex Strings • Senior Division

PROBLEM: Transform a given string by first keeping just the alphanumeric characters (i.e. 0-9, A-Z, a-z). Sort the remaining letters and then rearrange the repeated blocks of letters such that the longer blocks come first. Within blocks of the same length, the first block is sorted in ascending order; the next block, in descending order; then ascending order; and so on. Finally, change it to compressed form by printing the size of each block followed by the characters for that size. Use a comma to separate each differently-sized block.

For example, in the string “This is an Example of Sorting an interesting string”, create the result as follows:

Sorted order: ESTaaeeefggghiiiiilmnnnnnnnooprsssttttx
Blocks of 6: iiiiii nnnnnn
Blocks of 4: tttt ssss
Blocks of 3: aaa eee ggg rrr
Blocks of 2: oo
Blocks of 1: E S T f h l m p x
Printed format: 6in,4ts,3aegr,2o,1ESTfhlmplx

INPUT: Your program will receive a single line of data, each containing a single string.
Ignore all spaces and non-alphanumeric characters. Each line will be no more than 100 characters.

OUTPUT: Print each input string in the rearranged order, as described above.

SAMPLE INPUT:

This is an Example of Sorting an interesting string
HackerRank.com was used for the ACSL Finals this year.
The digits of PI are 3.141592653.
She sells seashells by the seashore.
Programming languages include Java, Python, C++, Visual BASIC, Ruby, and Scratch.

EXPECTED OUTPUT:

6in,4ts,3aegr,2o,1ESTfhlmplx
5a,4se,3r,2tonkihc,1ACFHLRSdflmuwy
2135ei,1tsrohgfdaTPI9642
7es,4lh,2a,1ytrobS
8a,5n,4gu,3rlic,2CPSdehmosty,1vbVRJIBA

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TEST INPUT:

COVID-19 is a global pandemic and a virus that changed everything in the entire world.
The Computer Science Teacher Association had a virtual Conference in 2020.
The digits of PI are 3.14159265358979323846264778327, not rounded.
Peter Piper picked a peck of pickled peppers. How many pickled peppers did Peter Piper pick?
There are 10 kinds of people: those who know binary and those who don't.

EXPECTED OUTPUT:

7ae,6ni,5t,4rhd,3gl,2vsoc,119CDIOVbmpuwy
9e,5nica,4or,3th,202CTsu,1vpmlfdSA
53,472,345689deo,2trni1,1IPTafghsu
14e,13p,7i,6r,5cdk,4P,2alost,1ywnmfH
8o,7e,5hn,3wtsrda,2ikp,1ylfbT10

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问题: 变换特定的字符串。首先只保留字母和数字字符(即 0-9, A-Z, a-z), 将剩下的字母进行排序, 然后重新排列包含重复字母的字符块, 使得包含字母数量多的字符块排在前面。如果字符块内包含字母的种类数目相同, 那么第一个字符块按照递增顺序排列, 第二个字符块按照递减顺序排列, 第三个按照递增顺序排列, 依此类推。最后, 以简写形式打印输出这个字符串: 先打印输出每个字符块的大小, 然后打印输出每个字符块包含的字符, 用逗号将每个大小不同的字符块分隔开。

例如, 字符串“This is an Example of Sorting an interesting string”的变换过程如下所示:

排序结果: ESTaaeeefggghiiiiilmnnnnnnnooprsssttttx
6号字符块: iiiiii nnnnnn
4号字符块: tttt ssss
3号字符块: aaa eee ggg rrr
2号字符块: oo
1号字符块: E S T f h l m p x
打印输出格式: 6in,4ts,3aegr,2o,1ESTfhlmpx

输入: 你将会接收到一行数据, 每行包含一个单独的字符串。忽略所有空格和非字母数字的字符。每行不超过 100 个字符。

输出: 如上所述, 按照重新排列好的顺序打印输出每个输入的字符串。

示例输入:

```
This is an Example of Sorting an interesting string
HackerRank.com was used for the ACSL Finals this year.
The digits of PI are 3.141592653.
She sells seashells by the seashore.
Programming languages include Java, Python, C++, Visual BASIC, Ruby, and Scratch.
```

预期输出:

```
6in,4ts,3aegr,2o,1ESTfhlmpx
5a,4se,3r,2tonkihc,1ACFHLRSdflmuwy
2135ei,1tsrohgfdaTPI9642
7es,4lh,2a,1ytrobS
8a,5n,4gu,3rlic,2CPSdehmosty,1vbVRJIBA
```

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测试输入:

COVID-19 is a global pandemic and a virus that changed everything in the entire world.
The Computer Science Teacher Association had a virtual Conference in 2020.
The digits of PI are 3.14159265358979323846264778327, not rounded.
Peter Piper picked a peck of pickled peppers. How many pickled peppers did Peter Piper pick?
There are 10 kinds of people: those who know binary and those who don't.

测试输出:

```
7ae,6ni,5t,4rhd,3gl,2vsoc,119CDIOVbmpuwy
9e,5nica,4or,3th,202CTsu,1vpmlfdSA
53,472,345689deo,2trni1,1IPTafghsu
14e,13p,7i,6r,5cdk,4P,2alost,1ywnmfH
8o,7e,5hn,3wtsrda,2ikp,1ylfbT10
```